

NAVAL REACTORS DOE ORDER IMPLEMENTATION BULLETIN NUMBER 420.1-81,
REV 4, FACILITY SAFETY

Naval Reactors Implementation Bulletin (IB) 420.1-81, Revision 3 for DOE Order 420.1B, is hereby cancelled. NR IB 420.1-81, Revision 4 implements DOE Order 420.1C dated December 4, 2012. DOE Order 420.1C contains an equivalency for Naval Reactors and specifically identifies that the "Deputy Administrator for Naval Reactors (Director) will implement and oversee requirements and practices pertaining to this Directive for activities under the Director's cognizance, as deemed appropriate."

Consistent with the Naval Nuclear Propulsion Program (NNPP) overall concept of operations, the following provides specific implementation guidance for DOE Order 420.1C, FACILITY SAFETY (hereafter referred to as "the Order"), for those activities under the Director's cognizance. This guidance takes precedence over DOE Order 420.1C, FACILITY SAFETY and guidance found in other related DOE documents.

For matters in which Naval Reactors has prescribed or approved requirements for use in the NNPP, the Naval Reactors requirements shall be used in lieu of guidance contained in DOE Order 420.1C or any referenced order or guide. Such matters include requirements pertaining to the design, development and servicing of prototype and shipboard naval nuclear propulsion plants and their support equipment and test facilities; radiological controls, including the control of radioactivity and radiation associated with the Naval Reactors program; reactor and nuclear safety; and matters affecting the occupational safety and health of the workforce.

Although this Order has an NR equivalency, it is NNPP practice to apply the provisions of DOE orders to the extent they are appropriate and consistent with Program practices. Accordingly, Program elements shall implement the requirements of the Order in accordance with the following:

1. The duties and responsibilities delineated in the Order for various DOE headquarters components are carried out by Naval Reactors in accordance with existing Program policies and practices. Involvement of other DOE headquarters offices shall be initiated by Naval Reactors as appropriate.
2. Attachment 1, CONTRACTOR REQUIREMENTS DOCUMENT, section 1.c. states Contractors must satisfy the requirements (i.e., mandatory statements) in DOE technical standards and industry codes and standards identified as applicable. The base code requirements for new construction and modifications to existing facilities are located in the Naval Reactors Fire Protection Requirements Manual, NAVSEA S9213-62-MAN-000 (NR FPRM) and are equivalent to those identified DOE technical standards and industry codes and standards. The Contractor Requirements Document (CRD) should not be included in the Prime Contract. This IB shall be considered the CRD and

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includes the requirements set forth in Attachments 2 and 3 of the Order except as modified by this IB.

a. For specific projects, the Prime Contractor will submit to the Authority Having Jurisdiction (AHJ)/Building Official for approval any recommended variations from the base code requirement set.

b. For all other matters, the design guidance contained within DOE Order 420.1C and associated Implementation Guides and Standards shall be fully evaluated for the occupancy and use of the building. In all cases, design requirements which are applied to Naval Reactors Program facilities shall be based on sound engineering judgment with consideration of the intended function of the facility in support of Naval Reactors Program activities. For guidance in DOE Order 420.1C not considered appropriate or necessary for application to the design of specific Naval Reactors Program facilities, a recommendation or request of equivalencies should be made to the Field Office and waivers to Headquarters.

3. Attachment 2, Chapter I. NUCLEAR SAFETY DESIGN CRITERIA documents the requirements for safety design of DOE hazard category 1, 2, and 3 nuclear facilities. This chapter should be used as guidance in the design and construction of new or major modifications to facilities meeting the definition of hazard category 1, 2, and 3 nuclear facilities. The criteria in Attachment 3 of DOE Order 420.1C are to be used as applicable in support of project design and construction for DOE hazard category 1, 2, and 3 nuclear facilities; existing NR program equivalent criteria takes precedence over the criteria contained in Attachment 3.

4. Attachment 2, Chapter II. Fire Protection, section 3.a.(2).(c) details conflict resolution between DOE O 420.1C, National Fire Protection Association (NFPA) codes and standards, and the applicable building code. For the NR DOE sites the NR FPRM takes precedence over DOE O 420.1C, NFPA, and building code requirements with respect to fire protection.

5. Attachment 2, Chapter II. Fire Protection, section 3.d.(2), Implementation discusses elements that need to be addressed to effectively implement the criteria and procedures outlined in section 3.d.(1), Criteria and Procedures. The following are requirements for the NR fire protection program;

a. As provided for in DOE-STD-1066-2012 Naval Reactors' Prime Contractor shall appoint qualified fire protection engineers (FPE) to act as the Code Official on routine fire protection matters, such as documented review of plans, specifications, procedures, and acceptance tests. Other fire protection program responsibilities that include those listed in section 3.d.(1) of the Order that are not specified in the Order as FPE specific

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duties can be performed by other competent Prime Contractor personnel. The day-to-day activities performed in support of the fire protection program shall be documented in the fire protection program's files.

b. Exemptions from NR fire protection program design standards and requirements will be submitted to Naval Reactors Headquarters as the AHJ/Building Code Official for review and approval.

c. Naval Reactors Field Offices will act as the AHJ/Building Code Official for the disposition of issues involving the implementation of equivalent means of fire protection when standards allow for alternatives with AHJ/Building Code Official approval.

d. The local Naval Reactors Field Office as well as Naval Reactors shall be included in all required notifications of fire protection system impairments. Fire protection system impairments shall be defined as a condition where a fire suppression (water, liquid or gas based system) or fire alarm system or any unit/portion thereof is out of service and the condition can result in the fire protection system or unit not functioning as designed in a fire or potential fire event.

e. The Prime Contractor will provide data annually in the DOE Annual Fire Protection Report with each site being addressed on the status of fire protection to be reported to the AHJ/Building Official via the Naval Reactors Field Office. NRLFO will forward the report to Naval Reactors Headquarters. The annual report should include the results of the inspection, testing, and maintenance program for each site. Further dissemination of this report will be at the discretion of Naval Reactors Headquarters.

6. Attachment 2, Chapter II. Fire Protection, section 3.e., Emergency Response states the Contractor will provide emergency response capabilities, as necessary, to meet site needs as established by the baseline needs assessment (BNA), safety basis requirements, and applicable regulations, codes and standards. The firefighting policies and practices at Naval Reactors Program facilities shall be based on the following:

a. NFPA 1500, STANDARD ON FIRE DEPARTMENT OCCUPATIONAL SAFETY AND HEALTH PROGRAMS (2013) and DOE implementation guidance per EH-321 memo dated September 29, 1988.

b. NFPA 600, STANDARD ON INDUSTRIAL FIRE BRIGADES (2010). The standard provides minimum requirements for organizing, operating, training, and equipping industrial fire brigades as well as minimum levels of occupational safety and health for industrial fire brigades

c. Naval Reactors prototype nuclear propulsion plants are designed, maintained, and operated equivalent to shipboard naval nuclear propulsion plants with the stringent

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standards necessitated by their military application. Fire protection features and firefighting practices in the operating prototype plants are comparable to Navy nuclear-powered fleet combatants. Accordingly, the provisions of NFPA 600 and 1500 are not applicable to fire fighting in-hull at Naval Reactors operating prototypes. Prototypes in standby status should follow the guidelines in the next section. The Program's existing policies and practices regarding fire fighting in-hull at Naval Reactors operating prototypes, as articulated in Naval Reactors letters F#C89-3018 dated November 27, 1989; F#91-11530 dated June 11, 1991; F#94-02927 dated April 20, 1994; F#08-00466, dated March 25, 2008, and as implemented in Naval Reactors procedures F-10 and F-10A remain in effect.

d. Firefighting at Naval Reactors Program facilities, except for the Naval Reactors Facility (NRF), relies on on-site trained firefighting personnel and augmentation by off-site firefighting departments. Arrangements with outside firefighting departments are specifically developed for this purpose by the cognizant Naval Reactors Field Office. On the basis of the availability of off-site firefighting support, it is Naval Reactors policy that NFPA 600 is the appropriate standard for firefighting personnel at Program facilities. NRF should continue limiting its firefighting efforts to incipient stage fires and use off-site fire departments for structural firefighting.

(1) Consistent with NFPA 600, interior structural firefighting at Naval Reactors Program facilities does not require a minimum five-man firefighting force. The size and makeup of the force shall be determined by the fire brigade scene leader based on the fire situation.

(2) Personnel designated as firefighters should receive Firefighter I equivalent training and they should be encouraged to participate in a physical fitness program. Naval Reactors Program facilities should determine the number of personnel requiring training at each site. Activities may provide a higher level of training and qualification for firefighting personnel if considered appropriate to meet local needs (e.g. participation in off-site mutual aid agreements).

(3) Support from off-site fire departments will be necessary in most cases to fight a structural fire at Naval Reactors Program facilities. A satisfactory response capability by off-site fire departments must be maintained. A drill should be run at each activity at least annually involving the off-site fire departments if feasible. In the event a drill is not feasible a site tour/briefing with off-site supporting fire departments should be performed annually to ensure site familiarization is maintained.

(4) To enhance early detection and suppression of any fires, early warning measures (e.g. smoke detectors) and firefighting equipment (e.g. automatic suppression

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systems) should be used as deemed necessary by the FHA process and approved by the AHJ/Building Code Official.

(5) Baseline needs assessment of fire protection adequacy at Naval Reactors Program facilities should, at a minimum, include the following items:

- Review of fire protection features for individual buildings that have undergone a change in usage since the previous assessment.
- Review of firefighter equipment and training.
- Review of fire-related incident reports, unplanned events reports and critique minutes.
- Review facility plans to secure electricity and gas to facilities in the event of a fire.
- Review after action findings of drills with off-site fire department.
- Review after action findings of drills with on-site fire department.

7. Attachment 2, Chapter II. Fire Protection, section 3.g., Wildland Fire specifies that an integrated site-wide wildland fire management plan, consistent with the *Federal Wildland Fire Management Policy*, must be established and implemented in accordance with NFPA 1143, STANDARD FOR WILDLAND FIRE MANAGEMENT, 2009.

a. For NR DOE sites, an analysis shall be performed to determine the risk of wildland fires unique to each site's geographic location.

b. NR sites determined to be at risk for wildland fires shall follow the requirements in section 3.g of the Order. Chapter 4, (except section 4.5.5) and chapter 5 of NFPA 1143, STANDARD FOR WILDLAND FIRE MANAGEMENT, 2009 should be used as guidance for incorporating wildland fire emergency actions into existing incident response procedures. Existing emergency response plans and elements meet or exceed the requirements on the remaining portions of NFPA 1143.

c. Wildland fire management plans shall include provisions for monitoring air quality and any necessary operational restrictions during periods of degraded air quality.

8. Attachment 2, Chapter III. Nuclear Criticality Safety, the governing Federal regulation for managing nuclear safety for DOE, 10 CFR 830 (Nuclear Safety Management) excludes "Activities conducted under the authority of the Director, Naval Nuclear Propulsion, pursuant to Executive Order 12344, as set forth in Public law 106-65". Unless otherwise directed by Naval Reactors, the following Naval Reactors approved documents, as well as the procedures, analyses, and practices that are based on these documents, shall continue to be used in lieu of DOE Order 420.1C:

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- LAB-NCS-1000 NUCLEAR CRITICALITY SAFETY MANUAL for the Bettis and Knolls Laboratories
- NRF-1600 FUEL HANDLING NUCLEAR SAFETY MANUAL for examinations work at the Naval Reactors Facility.
- RIM-63 REACTOR INSTALLATION, MAINTENANCE, AND REFUELING SYSTEM SPECIFICATION for reactor servicing operations.

The above documents provide an equivalent level of criticality safety protection.

9. Attachment 2, Chapter IV. Natural Phenomena Hazards Mitigation, DOE-STD-1020-2012, *Natural Phenomena Hazards Analysis and Design Criteria for DOE Facilities*, has been updated from the 2002 version and replaces Performance Categories (PCs) and the associated Natural Phenomena Hazards (NPH) design requirements with Design Categories (DCs) that correspond to specific NPH, e.g., Seismic (SDC), Wind (WDC), Flood (FDC), etc., utilizing a graded approach for specific facility design requirements utilizing appropriate national consensus standards versus unique DOE terminology and design parameters.

a. The DOE-STD-1020-2012 should be used for evaluating NPH mitigation design requirements for new facility projects or major repair/renovation projects to existing facilities.

b. Existing facilities that have an identified PC under the guidance of DOE-STD-1020-2002 are not required to be reclassified.

c. Structures, Systems, and Components (SSCs) important to safety in all Highly Protected Risk (HPR) facilities should be identified and documented.

d. Non-safety SSCs for all facilities should be designed such that their failure does not prevent safety class SSCs from functioning.

10. Attachment 2, Chapter V. Cognizant System Engineer Program, current NNPP policies and practices meet the Order's standards for a Cognizant System Engineer Program. NNPP nuclear facilities shall implement the requirements of Chapter V of the Order subject to the following modifications:

a. Section 3.e of Chapter V of the Order discusses qualification requirements for a Cognizant System Engineer (CSE). The Order also states that qualification requirements for CSEs must be consistent with those defined for technical positions described in DOE Order 426.2, PERSONNEL SELECTION, TRAINING, AND CERTIFICATION REQUIREMENTS FOR DOE NUCLEAR FACILITIES. The current NNPP policy regarding CSE training and qualification, which meets or exceeds those

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requirements of DOE Orders 420.1C and 426.2, is outlined in Naval Reactors Implementation Bulletin 426.2-71, Revision 2 and various facility-specific documents and manuals.

b. Each NNPP facility is responsible for ensuring safety significant SSCs are properly identified and maintained in accordance with the Prime Contractor's CSE program. Periodic reviews of all SSCs should be conducted to ensure SSCs remain appropriately categorized and safety significant systems or requirements are documented in existing facility manuals.

Oversight and evaluation of FACILITY SAFETY matters under the Director's cognizance will be conducted by the Naval Reactor Laboratory Field Office with additional oversight provided by Naval Reactors Headquarters.

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